2016 National and Local Elections

AUTOMATION PROJECT

(DRE)

TERMS OF REFERENCE
13 October 2014

2016 NLE Steering Committee
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Chapter 2 OBJECTIVE

The Commission on Elections (COMELEC) aims to automate the 09 May 2016 National and Local Elections (NLE).

Election automation starts with the pre-election preparation of configuration data up to the election-day (e-Day) processes of voting, counting of votes and generation of precinct results. It also includes the canvassing of transmitted results and proclamation of winning candidates in all levels of concerned elective offices up to the post election activities such as post audit of election results, the backup and retrieval of all files and documents, the restoration of backup files, and the submission of all reports and other post election activities related to the project.

Also included in this automation endeavor is the secure electronic transmission of results.

Chapter 3 INTENT

The COMELECshall be accepting public bids for the lease, with an option to purchase, of an integrated[1]**Automated Election System (AES)** that shall meet the following general requirements:

1. Provides for a single **Election Management System**(EMS) that efficiently and effectively manages pre-election data for all voting, consolidation, canvassing, and transmission configuration needs of COMELEC;

2. Provides for four hundred ten (410) units of secure **precinct-based voting system** that uses touch-screen, push-buttons, or similar device for voters to indicate their vote intent and appropriate ballot boxes to store receipt of votes securely and safely;

3. Provides for a secure **precinct-based vote counting system** to accurately count and store consolidated votes cast by voters;

4. Provides for a **built-in automated precinct results security system** using digital signatures and cryptography such that the same cannot be tampered with and cannot be read outside of the AES;

5. Provides for a **built-in automated and immutable**[2]**system auditability** in each of the AES components or sub-systems to accurately trace and verify the sequence of events in the system for each operational step;

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[1] By an "integrated"system, we mean that the 2016NLE AES, as a whole, is envisioned to be a unified system, which may be composed of separate sub-systems but must seamlessly and smoothly interact with each other to meet COMELEC's desired requirements.

[2] By an "immutable" system auditability feature, we mean that the event logging capability of the AES,including each of its sub-systems, must only be managed by the system itself. Any changes made to the concerned log file outside of the system must be recognized and identified by the AES as an intrusion to the same.Aside from the system's log files, all AES reports shall also be considered an integral part of the entire system's auditability feature.

6. Designed tobe easy to understand, use, operate, implement and manage

7. **Supported by** a sufficient number of qualified technical support personnel, who are knowledgeable on the design, election configuration, preparation, use, operation, implementation and management of the offered AES and its components or sub-systems; and

8. Makes use of appropriate and suitable materials and supplies to ensure correct operation of all AES components or sub-systems.

Chapter 4 PROJECT SCOPE

This Terms of Reference (TOR) document limits the offers for precinct-based technologies that shall be accepted by COMELEC to Direct Recording Electronic (DRE) technology.

This Project only covers the provision of systems, equipment, peripherals, supplies and materials, and services that are directly related to the herein indicated automated elections. Specifications of which are provided hereafter.

Chapter 5 . MINIMUM TECHNICAL SPECIFICATIONS

COMPONENT 1: Election Management System (EMS) and Precinct-Based Direct Recording Electronic (DRE) Technology

The bidder shall show proof of compliance to the following minimum technical specifications for the required Automated Election System (AES) for the 2016 NLE. The bidder's claims of compliance shall be supported by documentary evidence and shall be verified and validated by a product and/or systems test to be conducted by COMELEC, as applicable.

A. Election Management System (EMS)

Which shall refer to all election data management requirements to be used in managing the preparation of all pre-election data for election configuration purposes.

EMSshall have the following minimum requirements:

1. It shall have the following general capabilities:
   - 1.1 **System administration utilities**, which shall be used in managing user accounts, rights and privileges, including system and audit log files monitoring and backup files generation, among others;
   - 1.2 **Pre-election data management**, which shall be used in managing all data to be used for election purposes, including data import of election data files from existing COMELEC software applications;
   - 1.3 **Election configuration files management and generation**, which shall be used in generating the location-specific configuration files for each DRE orElectronic Voting Machine(EVM);
   - 1.4 **Ballot definition management** and **ballot face generation**, which shall be used in managing the generation of the ballot faces;
   - 1.5 **Machine configuration management**, which shall be responsible for turning on or off certain functionalities in the **EVM**; and
   - 1.6 **Election results report format management**, which shall be used in managing all report formats to be used in the **EVM**.
2. It shall be a single integrated system, where all functionalities are made available from one user interface (UI).
   - 2.1 All election data management requirements - from importing or encoding of data to generation of all election configuration files, ballot faces, passwords and all reports - shall be completely and fully provided by the EMS.
   - 2.2 No other additional computerized applications or scripts outside of the system shall be used to execute these data management functionalities.
3. It shall use a database management system (DBMS) that is compatible with the current DBMS of the COMELEC, such as Oracle, MySQL or MS SQL.
4. All user activities in the system shall be logged by the system, together with the date-and-time stamp for each.

5. It shall allow the following data or record management functionalities based on user access rights privileges:
    5.1 Importing, creation or addition of new records;
    5.2 Reading, displaying or viewing, printing of records;
    5.3 Updating or editing records; and
    5.4 Deletion or removal of records.
    5.5 Creation of **EVM** configurations and passwords & usernames, ballot faces and other requirements of the system
6. It shall manage the following election data[3]:
    6.1 Geographical sub-divisions, such as regions, provinces, cities, municipalities, and barangays;
    6.2 Voting jurisdictions, such as legislative districts, provincial districts, regional districts, councilor districts, and post/embassies (which is applicable for participating Overseas Voting (OV) countries only), and precincts;
    6.3 Number of registered voters per established precinct;
    6.4 Number of registered voters per clustered precinct;
    6.5 Elective positions and number of seats to be voted for per position;
    6.6 Candidate information, such as full name, nickname/stage name, elective position, gender, political party affiliation, jurisdiction where he intends to run;
    6.7 Arabic text[4];
    6.8 Title and date of elections;
    6.9 Information on members of the Boards of Election Inspectors (BEI), such as, but not limited to:
        6.9.1 Full name;
        6.9.2 Position in the Board (such as BEI Chairman, BEI Poll Clerk, BEI Member, EVM Technical Support);
        6.9.3 Area of assignment;
        6.9.4 User identification and password;
        6.9.5 Digital certificate or private/public key pair; and
        6.9.6 Other data that shall be needed in the configuration of ballot face, and EVMs.
    6.10 Geographical sub-divisions, such as regions, provinces, cities, municipalities, and barangays;

[3] Annex L shows the detailed data structure of the databases to be provided by COMELEC

[4] Arabic text shall be used to show the equivalent Arabic translation of the English label of elective positions in the ballots for he Autonomous Region in Muslim Mindanao (ARMM) areas.

6.11 Voting jurisdictions, such as legislative districts, provincial districts, regional districts, councilor districts, and post/embassies (which is applicable for participating Overseas Voting (OV) countries only), and precincts;

6.12 Number of registered voters per established precinct;

6.13 Number of registered voters per clustered precinct;

6.14 Elective positions and number of seats to be voted for per position;

6.15 Candidate information, such as full name, nickname/stage name, elective position, gender, political party affiliation, jurisdiction where he intends to run;

6.16 Arabic text[5];

6.17 Title and date of elections;

7. It shall allow for the user-configuration of the following:

7.1 number of security keys or users needed to access the functionalities of EVM; and

7.2 transmission destination of each position in the **EVM**.

8. It shall provide functionality for the creation and management of report templates[6] for use in the reports to be generated by the **EVM**.

8.1 It shall also allow for the option to import report templates in ODF format like in*MSWord* or *LibreOfficeWriter* files.

8.2 The system shall also allow the editing of entries or contents in said report templates, such as, but not limited to:

8.2.1 Elective positions included in the report;

8.2.2 Wording of certification;

8.2.3 Report format design;

8.2.4 Data fields for inclusion; and

8.2.5 Other information.

9. It shall be able to generate the election configuration files needed to configure the EVM using the same source data.

9.1 The configuration file shall be location-specific and shall restrict the votes and results that can be accepted by each machine depending on the configured location.

10. It shall have a **ballot definition module** which shall have the following minimum functionalities:

10.1 It shall be able to automatically create the ballot faces for EVM;

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[5] Arabic text shall be used to show the equivalent Arabic translation of the English label of elective positions in the ballots in areas where the use of Arabic language is prevalent.

[6] The COMELEC shall provide the format of all reports.

10.2 It shall enable the user to preview the generated ballot faces for verification purposes.

10.3 There shall be one ballot face for each area with a common set of candidates from the national level down to the city/municipal level or councilor district level.

10.4 It shall automatically create a unique ballot face for each precinct.

10.5 The ballot design and layout shall be customizable as to final specifications of the COMELEC

10.6 In areas where Arabic is of general use, such as in the ARMM provinces, the ballots shall have an Arabic translation of the titles of the offices to be voted for, in addition to and immediately below the English titles.

10.7 There shall be as many ballot faces as there are cities/municipalities and councilor districts for the NLE.

11. It shall be capable of maintaining an immutable audit log which shall contain the following information, in the very least:

    11.1 Unique EMS Machine ID;

    11.2 Unique user ID for each EMS user;

    11.3 Date and time of logged event;

    11.4 Type of event;

    11.5 Specific user action or activity; and

    11.6 Error messages.

12. Entries in all log files shall be written in such a way that they can be easily understood and shall not make use of coded language, without readily providing the equivalent meaning.

    12.1 The system shall enable the user to select a period of date/time to display the concerned contents of the log files.

13. It shall allow the export of the databases or data tables containing the information of these reports in MySQL or CSV file format.

14. It shall have a built-in system functionality to allow back-up of all data in the EMS server.

15. It shall be able to assign a unique ballot ID for each ballot face.

16. It shall be able to display the hash code of at least SHA128 for the system.

    16.1 It shall be able to print this hash code on all reports to be generated by the system.

    16.2 The winning bidder shall provide a hash extractor and hash validator for the system.

        16.2.1 The source codes of the hash extractor and hash validator, with proper documentation, shall be turned-over to COMELEC before its implementation.

17. The system shall be able to verify whether the sensor correspond to the name of the candidate on the ballot display are correct.
18. The system shall be able to export the ballot face to PDF format or to any format for verification purposes;
19. The ballot design shall have the following required features:
    19.1 Seal of the Republic of the Philippines
    19.2 The date and title of the elections
    19.3 The position and names of the candidates.
    19.4 The Information that shall identify the ballot jurisdiction codes and its ballot code.
    19.5 It shall be able to handle all candidate names of the position in one display, without truncating the same
20. The base Source Code shall be made available to COMELEC not later than 60 days from the issuance of the Notice of Award for purposes of Source Code Review by interested parties, subject to set rules and regulations for the same COMELEC.
21. It shall be customizable in accordance with the requirements of this TOR.
22. The system is required to have the following minimum **customizable functionalities** to be tested and verified during the scheduled systems customization or before the systems acceptance or as indicated in the requirement:
    22.1 It shall be capable of managing pre-election configuration data by importing the following data from the COMELEC EMS (sampletemplate of the file to import in Annex __). This requirement shall be demonstrated by the bidder to the COMELEC during the first stage bidding.
        22.1.1 Geographical sub-divisions, such as regions, provinces, cities, municipalities, and barangays;
        22.1.2 Voting jurisdictions, such as legislative districts, provincial districts, regional districts, councilor districts, and post/embassies (which is applicable for participating Overseas Voting (OV) countries only), and precincts;
        22.1.3 Number of registered voters per established precinct;
        22.1.4 Number of registered voters per clustered precinct;
        22.1.5 Elective positions and number of seats to be voted for per position;
        22.1.6 Candidate information, such as full name, nickname/stage name, elective position, gender, political party affiliation, jurisdiction where he intends to run;
        22.1.7 Arabic text[7];

[7] Arabic text shall be used to show the equivalent Arabic translation of the English label of elective positions in the ballots for he Autonomous Region in Muslim Mindanao (ARMM) areas.

22.1.8 Title and date of elections;

22.2 The system shall not allow edit, delete or add to the data imported from COMELEC EMS created configuration

22.3 It shall be able to generate and display imported data and set configurations for verification purposes.

22.4 It shall provide different options for filtering display or views of imported data and set configurations to facilitate verification, such as, but not limited to:

22.4.1 List of geographical divisions, with registered voters;

22.4.2 List of voting jurisdictions, with registered voters;

22.4.3 List of configured elective positions and number of seats to vote for each position:

22.4.3.1 Per city/municipality;

22.4.3.2 Per province;

22.4.3.3 For ARMM;

22.4.3.4 Nationwide; and

22.4.3.5 Other positions that may be added before the elections.

22.4.4 List of candidates;

22.4.4.1 per district (councilor district, provincial district, legislative district, regional district);

22.4.4.2 per city/municipality;

22.4.4.3 per province;

22.4.4.4 for ARMM;

22.4.4.5 for national positions; and

22.4.4.6 Other geographic subdivision that may be added before the elections.

22.4.5 List of precincts, with registered voters;

22.4.5.1 List of established precincts;

22.4.5.2 List of clustered precincts;

22.4.5.3 List of clustered precincts, with established precincts included in the cluster;

22.5 It shall allow for the editing or modification of entries or data provided by the winning bidder.

22.6 The system shall also be able to display summary statistical figures in relation to the above lists or displays to facilitate verification.

22.7 It shall require authorization and authentication of all users with the use of unique usernames and user-modifiable passwords, at the very least, with multiple user access levels.

22.8 User access levels shall be categorized, at the very least, as follows:

22.8.1 **Regular** user, which shall be assigned with basic computer operational roles, such as generation of approved configuration files, usernames and passwords, and viewing of data;

22.8.2 **Intermediate** user, which shall be assigned with regular user roles, correction of imported data, and approval of configuration files;

22.8.3 **Administrator**, which shall be assigned with all regular and intermediate user roles, and reference file management roles, including data import, together with monitoring roles;

22.9 It shall be easy to use and operate, and shall make use of a graphical user interface (GUI).

22.9.1 It shall have such features as understandable and helpful screen prompts, descriptive error messages with corresponding needed corrective actions, and help screens.

22.9.2 It shall have a built-in user or operation manual from a Help menu, which shall provide the needed instructions on how to use and operate the system.

22.9.3 It shall be easy to use in such a way that by just following the instructions in its User Manual, a user shall be able to successfully create all configurations, including the ballot faces, and without manual intervention from outside the system.

22.9.4 User rights and privileges shall be different for each user access level.

23. It shall be able to generate the following reports as of date/time of report generation:

23.1 Multi-level statistical reports on generated (and not yet generated) ballot faces per date, with summary and detailed listing;

23.2 Multi-level statistical reports on generated (and not yet generated) machine configuration files per date for all machines, with summary and detailed listing;

23.3 Multi-level statistical reports on generated(and not yet generated) machine usernames and/or passwords;

23.4 List of voting jurisdictions;

23.5 List of elective positions per voting jurisdiction; and

23.6 List of candidates per position per voting jurisdiction.

24. All related requirements by the system which are needed to make it fully operational for the entire duration of the project (including requirements for all tests, FTS, training, public demo, certification, e-Day) shall be included in the

proposal/offer, including the software and hardware, back-up power supply, all other supplies and materials, printers, and other equipment and peripherals, consumables and other related services.

B. Precinct-Based Vote Counting Machine (EVM)

The system shall comply with the following minimum requirements which shall be able to be demonstrated by the bidder as compliant during the submission of its Bid, unless specified as a customization requirement:

1. shall use DRE technology.
2. shall make use of touch-screen, push-buttons, or similar device for voters to indicate their vote.
3. shall accept and record the votes of candidates in a precinct (or clustered precinct);
4. shall protect the sanctity and secrecy of the voter's vote by ensuring that the record of the vote shall not be traced to the voter;
5. shall be accessible to illiterates and persons with disabilities.
6. shall be capable of locking the voting, in case the voter reached the configured number of minutes to vote.
    - 6.1. In case of voting locked, the system shall count only the votes made before it is locked and shall inform the voter of the event
    - 6.2. The system shall be capable of enabling or disabling this functionality
7. shall generate and print a machine readable (such as 2D barcode/QR Code) copy of the voter's vote for the voter's verification, or voter verified paper audit trail (VVPAT).
    - 7.1. The format of the VVPAT shall be provided by COMELEC during customization;
    - 7.2. The printed VVPAT contents shall be able to verify by using a barcode/QR code or similar technology reader.
8. VVPAT paper shall have appropriate and necessary safeguards to determine the authenticity of a VVPAT, such as, but not limited to, the use of bar codes, QR codes and the like.
    - 8.1. the print outshall remain legible for a minimum of six (6) years for a possible manual recount of said vote
9. shall also make use of appropriate VVPATboxes for the purpose;
10. For purposes of evaluating the bid, it shall allow voting of 100 voters in at most 12hours per machine, using the configuration to be provided by COMELEC;
11. shall allow consolidation of results of all EVMs, including logs and statistics allocated for the precinct or clustered precinct and immediately create the precinct's election results.
    - 11.1. in case of only one (1) EVM allocated for the precinct, it shall immediately create the precinct's election results, including logsand statistics after closing of polls

12. shall allow diagnostic test of all components of EVM to determine whether or not such components are functioning.

    12.1. Shall be able to print diagnostic report that shall show any of the components of EVM are not functioning or all components are functioning;

13. The system shall have an Open Voting and a Close Voting mode.

    13.1.1. The Open Voting mode shall signal the start of allowing the voting in the EVM.

        13.1.1.1. The EVM shall automatically print an initialization report

        13.1.1.2. The re-zero function can no longer be used once the EVM is in election mode (or in Open Voting mode).

    13.1.2. The Close Voting mode shall signal the stop of allowing the voting into the EVM and the start of report generation and electronic transmission activities.

14. shall ensure that each voter can only vote once.

15. shall be configurablefor use at the precinct level.

    12.1. shall allow the voting intended for an established or a clustered precinct, based on its configuration.

16. shall have a utility to accept election data from the EMS, such as voting jurisdiction data and candidate information, digital certificates, and other needed configuration data;

    16.1. All e-Day-specific information shall NOT be hardcoded into the system, but shall be referred to from external reference files or configuration files.

    16.2. This functionality can be accessed only by the administrator

    16.3. The configuration file's information shall include the date and title of the elections, system's geographic information (province, city/municipality, barangay, polling place, clustered precinct name), station no. of EVM in the precinct and other information that the system may require.

17. Shall be able to generate EML file on the format required by the COMELECCCS, CS/WS, TS, BS. For this purpose the COMELEC shall provide the template of the EML file to the bidders.

    17.1. This requirement shall be demonstrated by the bidders to COMELEC during the first stage of bidding (evaluation of the technical requirements)

18. During the first stage bidding, the bidder shall demonstratethe end-to-end process of the proposed system, from the existing EMS (creation of ballot face and configuration) to transmission of precinct results. For this purpose, the bidder shall:

18.1. Creation of configuration in EMS using the file provided by the COMELEC

18.2. Transmission of results from the EVM to the CCS to be used on e-Day.

19. The system shall employ sufficient security measures with regard to system access with the use of:

19.1. Unique user name/ID and password for each member of the BEI, which shall identify the concerned BEI Member and shall likewise be recorded in all audit log entries; and

19.2. Physical security devices, such as but not limited toUSB flash drives, with digital certificates for each BEI Member.

20. The system's hardware shall have a built-in printing capability.

21. The system's hardware shall have electronic transmission capability, which may or may not be integrated into system, and which shall enable theelectronic transmission of election results from the EVM to the designated CCS units and central server, transparency server, web server and backup server via wired or wireless technologies.

21.1. It shall be capable of using GSM, GPRS, Ethernet, VSAT and other transmission technologies.

21.2. It shall be capable of determining, from the recipient the receipt, of the transmitted election results

22. The system's hardware shall make use of alternative power sources, such as batteries, or power generators, which shall enable the EVM to fully operate for at least 14 hours.

22.1. For this purpose, the winning bidder shall provide the alternative power source which may or may not be integrated in EVM.

22.2. Transfer of power supply from the main source to alternative power shall be seamless.

23. The system shall be capable to authenticate from the number of BEI members as indicated in the configurationand to digitally sign the precinct results before printing the ER and transmitting the same to the designated destination.

24. The winning bidder shall also provide for all requirements (hardware, software and services) needed for the enrollment of the digital certificate/signature of all members of the BEI.

25. The system shall be able to generate and print the Election Returns (ER), statistical report and audit log for a precinct in the COMELEC-specified formats.

26. The system shall be able to create and save the following files, which shall not be removed or erased from memory even if the EVM is turned off:

26.1. Election results and other related files which are needed for canvassing/consolidation, shall be encrypted using at least 128-bit

standard encryption methodology with a security key or code (depending on the implementation by the vendor).

26.2. Database files or dump files for: (1) audit log; (2) election returns; and (4) statistical report, shall be encrypted using at least 128-bit standard encryption methodology with a security key (depending on the implementation by the vendor).

26.3. Print file reports[8] of (1) Election Returns (ER); (2) audit log; (3) statistical report; (4) VVPAT and (5) hash code generated for election results.

27. The system shall be able to transmit, using the designated transmission service, encrypted and digitally signed election results files, from the EVM to the destinations as set in the configuration. Default configuration shall be:

27.1. To the City/Municipal/post or embassy BOC;

27.2. To the central server, which shall be the gateway to the web server; and

27.3. To the transparency server.

28. The system shall be capable of creating a back-up of all data/files, audit log, statistics and copy of VVPAT to a removable storage medium.

29. The system shall automatically create and maintain an immutable and printable audit log report, recording the following information, at the minimum:

29.1. Unique read-only machine identifier, or any other machine identifier that is unique to each EVM

29.2. Voting jurisdiction configuration;

29.3. Date-and-time stamps of each system event and user-interaction activity;

29.4. Type of event;

29.5. Specific action or activity;

29.6. Specific identity of each user (i.e. Chairman, Poll Clerk, Member); and

29.7. The outcome (success or failure) of the event.

30. The system shall require authorization from the configuration-specified number of BEI members as indicated in the configuration file, through the entry of user name, unique password and physical access to machine.

31. The system shall be capable to authenticate from the number of BEI members as indicated in the configuration (at least 5) and to digitally sign the precinct results before printing the ER and transmitting the same to the designated destination.

32. The system shall be capable of zeroing out its result count storage which shall erase all previous counts in it.

32.1. It shall be able to generate an Initialization Report after this zeroing out to show that no votes have been cast or counted.

[8] The COMELEC shall provide the formats for the ER, audit log and statistical reports.

32.2. This re-zero function shall permanently delete all files created during the counting, including the copy of VVPAT, except for the audit log report.

32.3. Executing the re-zero function shall require the number of configuration-specified BEI members, including the required user ID and unique password for the designated EVM.

32.4. The re-zero function can be used only in as many times as the configuration-specified number of times for said function.

33. The system shall not allow voting of more than the specified number of registered voters configured for the system.

34. The system shall allow under-voting[9] and abstention[10] in any position to be voted for.

34.1. For statistical purposes, the number of under-votes shall be the number of the un-voted seats in a position.

34.2. For statistical purposes, the number of abstentions shall be recordedper position

34.3. If the required seat for an elective position is only one and it was not voted, it must not be statistically counted as an under-vote but as an abstention.

35. The system shall not allow over-voting[11] in a position

36. The statistical report shall contain the following information, among others:

36.1. Demographic information for the precinct (Province, City/municipality, post/embassy, barangay name, precinct number or clustered precinct name with the individual precinct numbers);

36.2. Number of registered voters for the precinct;

36.3. Number of voters who actually voted;

36.4. Number of under-votes for every position;

36.5. Number of abstentions for every position;

36.6. Turn-out for every precinct;

36.7. Fill-up rate for every position (1-(abstention/sum of total votes per candidate));

37. The system shall employ error handling procedures, including error recovery features, the use of error prompts and other related instructions to recover from an error.

38. The system shall require security access key (using password or physical security key)

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[9] Under-voting is when a mark in the oval for a position is less than the number of seats required for the position.

[10] Abstention is when there is no mark made in a position.

39. The winning bidder shall provide for a hash code extractor and hash code validator for the EVM.

    39.1. The source code of the hash extractor and hash validator shall be turned-over to COMELEC before the systems acceptance test.

40. If the system uses a customer-off-the-shelf operating system (OS), the winning bidder shall submit an OS hardening procedure documentation, which shall be subject to the agreement and final approval by COMELEC.

41. The bidder shall provide for a system that shall allow decryption and printing of each VVPAT and other files, and which shall decrypt the files from the media device used at the precinct level (VVPAT, local returns, national returns, audit log, stats or other files);

42. The system is required to have the following minimum **customizable functionalities** to be tested and verified during the scheduled systems customization or before the systems acceptance or on the schedule indicated in the requirement:

    42.1. The system shall be capable of creating a back-up of all data/files, which can be used for manual upload in the COMELECCCS, in case of failure of transmission.

    42.2. The system shall be able to display the hash code of the system, current date and time, the election configuration details, such as but not limited to the name and date of election, system's geographic information (province, city/municipality, barangay, polling place, Station no. of EVM in the precinct, clustered precinct name) status of EVM (closed or open) Cast Votes, on the EVM's display panel upon opening.

        42.2.1. The said hash code shall be printed in all reports to be generated by the machine.

    42.3. The system shall allow the voting only while the system is in Open Voting mode.

    42.4. The system shall allow input of the names of the members of the BEI

    42.5. Messages, prompts and reports and statistics format shall be in accordance with the COMELEC requirements

    42.6. Entries in the log files shall be written in such a way that they can be easily understood and shall not make use of coded language, without readily providing the equivalent meaning.

    42.7. A selective user-specified date range for audit log must be able to be printed using the system.

    42.8. The decryption and printing of each VVPAT and other encrypted files, shall have the following additional functionalities:

        42.8.1. The decrypted filename shall include the province, city/municipality and clustered precinct codes.

        42.8.2. The decryption shall allow printing of VVPAT image arranged sequentially by date or randomly as stored in the database

        42.8.3. Creating the list of filename of the VVPAT sorted by filename;

42.8.4. Each page shall have the filename printed on top of the page.

42.8.5. The filename of the VVPAT shall contain its unique ballot ID.

42.8.6. Converting the VVPAT into Portable Document Format (PDF) files;

42.8.7. Merging the PDF files into one PDF file;

42.8.8. Generating a hash code for each PDF file;

42.8.9. Saving the files, hash code to an external storage device;

42.8.10. Printing the hash codes, list of filenames, merged PDF file and other decrypted files;

43. The final design and functionality of the system for e-Day use shall still be subject to final customization requirements by the COMELEC.

43.1. For this purpose, the bidder shall submit a certification that all requirements for customization as stated in the TOR and RA 9369 shall be complied.

44. The system must have demonstrated capability and shall have been successfully used in a prior electoral exercise here or abroad, with a written certification to that fact from the election authority or election management body of the client country/state/province.

45. All related requirements by the system which are needed to make it fully operational during the entire duration of the project (all tests, FTS, training, public demo, certification, e-Day) shall be included in the proposal/offer, including the software and hardware, back-up power supply, external and removable data storage devices, paper, other supplies, printers and other equipment and peripherals, services, consumables and documentations.

45.1. All consumables, supplies and materials, such as removable storage devices, papers and the like, which are needed by the system to be operational, and which have used in all tests, and from before to after e-Day, including all documentations shall be proposed as purchased and shall all be turned over to COMELEC at no additional cost.

46. The winning bidder shall provide all hardware, software and service requirements that are be necessary to run the AES from preparation of configuration to post-election, including EVM[12] modems, back-up power supplies or batteries, external data storage devices, printers, and all other equipment and peripherals, services, consumables, and all other related supplies and materials.

[12] The number of required EVMs is indicated in **Annex J – EVM Allocationby Polling Center**.

C. Other Requirements

I. EVM/EMS

1. The winning bidder shall turn over to COMELEC the following:
    1.1. the settings, configuration, scripts, codes, or passwords used, at least one (1) week before e-Day;
    1.2. all disk images of all servers, used in the configuration and in the installation before e-Day;
    1.3. all back-up files, (EMS files, EVM files, ballot templates) one month after e-Day;and
    1.4. Application and procedures on restoration of back-up files and disk images, including information on minimum hardware requirements to restore the files.
2. The bidder shall submit the following technical documentations for EMS, EVM, ballot face printing,:
    2.1. User manuals;
    2.2. System Requirements Specifications, describing all the inputs, outputs, processing rules, volumes, performance, thresholds etc. of the system being described;
    2.3. System Design Specifications, describing the technical methods to build the system including design specifications, program specifications, data dictionary, entity relationships etc.;
    2.4. Training Manuals;
    2.5. Installation Procedures from scratch (OS, database, application, third party systems, pre-requisite requirements, configuration)
    2.6. Technical manuals on administration, troubleshooting and repair procedures;
    2.7. Setting up and securing the network infrastructure.
    2.8. Test Procedures;
    2.9. Other Support and Maintenance Manuals; and
    2.10. Other Standard Documentation.

    The winning bidder shall turn-over the final documents above, after the final customization of the system.
3. The winning bidder shall provide warranty for the entire duration of the project for all Components, all equipment and software, including provision of all

software/firmware upgrades or replacement of any defective components, entire units, or systems.

3.1. The bidder shall include in the submission of bid documents, the cost of each hardware part of the EVM.

3.2. The winning bidder shall submit a certification that all parts and components of the hardware shall be available for three (3) elections;

4. The winning bidder shall provide for a system that shall track the movement of the machines.

5. The winning bidder shall provide all requirements for the certification by International Certification Entity (ICE):

5.1. hardware, software, peripherals, documentation, consumables and other requirements of all systems without any additional cost to the COMELEC;

5.2. all technical support necessary, without any additional cost to the COMELEC; the services of the ICE shall be borne by the COMELEC.

5.3. before and after customization, turn-over all systems based on the COMELEC timelines, to the ICE, who shall review the system and conduct functional testing, such as but not limited to:

5.3.1. All scripts used;
5.3.2. System Development Kit (SDK) of the machine for EVM;
5.3.3. All applications;
5.3.4. All third party systems;
5.3.5. Batch files;
5.3.6. Utilities;
5.3.7. Circuits Schematics; and
5.3.8. All files that make the system operational.

6. Source Code shall be submitted by the bidders during first stage bidding.

6.1. For purposes of source code review and ICE by the interested parties, base source code shall be made available not later than 60 days from the issuance of the Notice of Award

7. The winning bidder shall authorize COMELEC to make the final source code of the EMS, EVM and all of its components available and open to any interested party or groups who may conduct their own code review thereof. A copy of the source codes shall be kept in escrow at the BSP.

8. The winning bidder shall provide for remote and on-site technical support in the conduct of source code review by the local interested parties, without additional cost to the COMELEC.

9. The winning bidder shall provide all requirements for the conduct of all trainings and public demonstrations

10. The winning bidder shall provide all requirements for the conduct of the different tests (Hardware Acceptance Test (HAT), Lab Test, Field Test, Mock Elections, Pre-Election Logic and Accuracy Test (PreLAT), TEC Certification Test, Live Transmission Test, Final Testing and Sealing (FTS)) and public demonstration**:**

    10.1 **HAT**, which stands for hardware acceptance test, and which shall cover all machines offered in the bidder's bid, including all standby units that shall be provided by the winning bidder to replace all defective units.

        10.1.1. This shall include all hardware to be offered the Project, including pre-election configuration, voting and counting.

        10.1.2. The EVM machine shall be subjected to an accuracy test.

        10.1.3. All hardware components, such as input and output devices, including all ports shall be completely subjected to HAT.

        10.1.4. All hardware peripherals, such as cables and cords, shall also be included in the test.

        10.1.5. A 20% sample of every delivery lot/batch shall be subjected to stress test.

        10.1.6. All hardware and peripherals shall have a unique bar-coded serial number for inventory purposes. If any hardware component shall not have any serial number from its manufacturer, the provider shall create its own and firmly attach it to the said component.

        10.1.7. All hardware that did not pass the HAT, for whatever reason, shall be replaced with a new unit within twenty-four (24) hours.

        10.1.8. The winning bidder shall provide HAT testers at no additional cost to COMELEC.

    10.2. **Lab test**, or laboratory test, which shall be an environment-controlled test of the Election-Day version of all systems to be used on e-Day; and

which shall be conducted twice using the first customized version, and the final trusted built version.

The final trusted built version of the system is the software compiled by the ICE.

10.2.1. An **end-to-end test** shall be conducted (from EMS to CCS all levels including transmissions, central server, transparency server, web server, and decryption).

10.2.1.1. The test shall make use of machines which have already passed the HAT.

10.2.1.2. The winning bidder shall submit a certification that it has already conducted its own internal Quality Control (QC) and Quality Assurance (QA) tests on its systems before turnover to COMELEC for Lab Test, and that its systems have already passed the same. In this case, two (2) certifications shall be submitted.

Submission of the Certifications shall mean that all minor programming errors have already been identified and consequently corrected by the winning bidder prior to turnover to COMELEC for lab testing. Failure of the winning bidder to conduct these QC and QA procedures shall be subject to imposition of the corresponding penalties.

10.2.1.3. The test shall include a compliance verification of technical specifications, as stated in this TOR and in the Systems Customization requirements, including:

10.2.1.3.1. **Accuracy test**, which shall be a test for the correctness of interpretation of votes as selected on EVM in accordance with the accuracy rating as indicated in this TOR;

10.2.1.3.2. **VVPAT test**, which shall be a test of the accuracy of votes

indicated in the VVPAT and verification of security marks;

10.2.1.3.3. **Access levels test**, which shall be a test of the availability and differences of levels of access into the system;

10.2.1.3.4. **Access security test**, which shall be a test for the effectiveness of the built-in security features of the system against attempts on unauthorized access into the system;

10.2.1.3.5. **Data encryption-decryption test**, which shall be a test for the availability of data encryption and decryption measures and its effectiveness in securing the system's data structure;

10.2.1.3.6. **Digital signature test**, which shall be a test for the availability of digital signatures as a security and non-repudiation measure;

10.2.1.3.7. **Data backup test**, which shall be a test on the availability of a data backup functionality, which includes a facility that is able to retrieve and make use of the backup data as input to the system, when the need arises;

10.2.1.3.8. **Backup power test**, which shall be a test of the availability of backup power supply to power up the machines, in case of power interruption;

10.2.1.3.9. **User interface design test**, which shall be a test of the ease of usage of the system to a regular user;

10.2.1.3.10. **Error messages test**, which shall be a test of the availability of easily understandable error messages, which would indicate to a user what error has occurred and the next step of action be to taken;

10.2.1.3.11. **Error recovery features test**, which shall be a test of the capability of the system to recover from an error without data loss;

10.2.1.3.12. **Reports generation test**, which shall be a test of the required election reports, such as the Initialization/Zero Out Report, Election Returns, Precinct Audit Log, Precinct Statistical Report, Transmission Log and other Reports;

10.2.1.3.13. **Report formats test**, which shall be a test for adherence to COMELEC-provided report formats;

10.2.1.3.14. **Environment tests**, which shall be a test for the machine's operational capability under the country's average highest recorded temperature and humidity conditions, and which shall be conducted with the assistance of DOST;

10.2.1.3.15. **Print legibility test**, which shall be a test for the readability or legibility of the reports generated by the proposed system after six (6) years, and which shall be conducted with the assistance of DOST; and

10.2.1.3.16. **Backup and Restore Test**, which shall be the test to back-up results or reports and to restore to its original format the backed-up results

10.2.1.3.17. **Other tests** for the compliance to all other technical specifications as stated in this TOR.

10.2.2. The test shall cover an end-to-end systems integration test for the following functionalities:

10.2.2.1. **Election data management**, which shall be a test of the system's capability to manage or prepare election data to be used for the elections;

10.2.2.2. **Election data configuration**, which shall be a test of the system's capability to prepare all the needed configuration data for all voting and counting machines;

10.2.2.3. **Election data configuration verification**, which shall be a test of the system's built-in capability to verify the correctness of the generated configuration of its election data;

10.2.2.4. **Ballot face configuration**, which shall be a test of the system's capability to prepare all the needed configuration data for ballot face generation;

10.2.2.5. **Ballot face configuration verification**, which shall be a test of the system's built-in capability to verify the correctness of the generated ballot configuration;

10.2.2.6. **EVM configuration**, which shall be a test of the system's capability to prepare all the needed configuration data for EVM;

10.2.2.7. **EVM configuration verification**, which shall be a test of the system's capability to verify the correctness of the generated ballot face machine configuration;

10.2.2.8. **User-friendly voting**, which shall be a test of the clarity of the messages as displayed on the machine's display and on the design of the ballot;

10.2.2.9. **Accurate counting**, which shall be a test for accuracy of the votes counted per machine;

10.2.2.10. **Easy systems reconfiguration** for a different election and/or different election type, which shall be a test of how easy the reconfiguration of the system for a new or different election or electoral event shall be implemented without the need for technical support service from the winning bidder; and

10.2.2.11. **Decryption of election results and VVPAT**, which shall be a test of decrypting the election results of EVM and verification of decrypted election results and VVPAT.

10.2.2.12. **Integration of EVM results with CCS,** which shall be a test of acceptability or compatibility of the EVM results by the COMELECCCS, CS, TS, WS, and BS;

10.2.2.13. **Electronic Transmission of results,** which shall be a test of the ability of EVM to transmit results electronically

10.2.2.14. All functionalities of all systems included in this TOR and functionalities to be proposed by the winning bidder, which shall be integral to the entire AES.

10.3. **Field test,** which shall follow the successful conduct of the Lab Tests, shall be an on-site integration test of e-Day procedures, from voting up to proclamation of winning candidates:

10.3.1. The test shall make use of machines which have already passed the HAT.

10.3.2. All different modes or types of transmission devices and telecommunication service providers shall be used in this Test.

10.3.3. The contingency plans for failure of devices and systems shall be simulated in this Test.

10.3.4. Areas with stable, unstable and without power supply and telecommunication service shall be the criteria for selection of the test areas including central server. transparency server; backup server, web server, NBOCs

10.3.5. The following shall be included in the test:

10.3.5.1. EVM;
10.3.5.2. Transmission;
10.3.5.3. all levels of CCS; and
10.3.5.4. central server, transparency server, backup server, web server

10.4. **Mock elections**, which shall be an actual demonstration to the public of the system's capabilities and readiness. It shall be a simulation of e-Day activities, from voting up to proclamation of winning candidates, after the successful conduct of the Lab and Field Tests;

10.4.1. The test shall make use of machines which have already passed the HAT and trusted build systems.

10.4.2. Registered voters, BEI members, technicians, CCS technical staff and BOC members shall participate in the mock elections.

10.4.3. With as much media coverage as possible, the Mock Elections shall be conducted in a COMELEC-selected area, with one (1) mock precinctutilizing 2 EVMs of fifty (50) mock voters per EVM.

10.4.3.1. In case the COMELEC decided to increase coverage of areas for mock elections, the COMELEC shall shoulder the additional expenses that may incur.

10.5. **TEC Certification**, which shall be issued by the Technical Evaluation Committee (TEC) through an International Certification Entity based on the following:

10.5.1. Successful conduct of Source Code Review, including the forensics of the hardware of EVM, the outcome of which shall form an integral part of its Certification Test.

All findings during the source code review must be closed/solved on:

10.5.2. Before the issuance of TEC Certification, all discrepancy findings shall be closed/solved.

10.5.2.1. A discrepancy that threatens the integrity of the election or could cause the results of testing to be not repeatable.

10.5.2.2. A discrepancy that adversely affects the understandability, maintainability, or reliability of the program, in a significant manner, but does not threaten the integrity of the election.

10.5.3. Certification testing of the system, to ascertain its compliance with provisions of RA 9369, RA 8436, and COMELEC's Request for Proposal for the Automation of the May 9, 2016 Elections; and

10.5.4. Successful conduct on of audit on the accuracy, functionality and security controls, including systems intrusion test to ensure that all security loopholes have been addressed.

10.6. **PRELAT**, which stands for Pre-election Logic and Accuracy Test, which shall be a test of E-Day configuration of each machine to be deployed using actual ballot face configuration:

10.6.1. The test shall make use of actual e-Day ballot face.

10.6.2. The test shall include voting of candidates by the operator, generation of reports and re-zeroing of the EVMs.

10.6.3. The test shall include transmission test to the canvassing system of the corresponding Board of Canvassers and to the central server, transparency server, backup server, and web server that shall be operational on e-Day.

10.6.3.1. At least 10% of the number of EVMs shall be tested using the actual transmission service to be used on e-Day.

10.7. **Final Testing and Sealing** (FTS), which shall be the final readiness test of all systems and machines to be used on e-Day, using actual machine configuration;

10.7.1. The test shall make use of the final trusted built version of the systems that shall be used on e-Day.

10.7.2. The test shall make use of machines which have already passed the HAT and PRELAT.

10.7.3. This shall happen on any day three (3) to seven (7) days before e-Day in all voting sites.

10.7.4. In case of problems during FTS, such as malfunction of the machines, error in the configuration, or error in the ballot face or other problems, the provider shall be responsible of correcting them without additional cost to COMELEC.

11. The winning bidder shall provide all materials, supplies, equipment and support services that shall be used in the conduct of all the above-mentioned tests at no additional cost to the COMELEC.

11.1. Materials shall include all documentations, consumables and test checklists that shall be used with the machines for the Tests.

11.2. Supplies shall include paper needed for the printing of all reports, the data storage devices and other supplies that may be needed by the system.

11.3. The winning bidder shall ensure that sufficient and efficient technical support personnel are present during the conduct of the Tests.

11.4. Aside from technical support personnel, services for installation of equipment shall also be provided by the winning bidder.

11.5. Sufficient standby units shall be provided on site by the winning bidder in case of defective units during the conduct of the Tests.

11.6. To facilitate the monitoring of the conduct of all the above-mentioned tests, the winning bidder shall also provide a computerized Machine Inventory System, the outputs of which shall also be used by the COMELEC, which shall have the following minimum functionalities:

11.6.3. Search capability using machine's serial number;

11.6.4. Database export facility to CSV format;

11.6.5. Report generation on:

11.6.5.1. List of machines which passed the HAT, PreLAT and all other hardware-related tests;

11.6.5.2. List of machines which failed the HAT, PreLAT and all other hardware-related tests;

11.6.5.3. Statistics on the number of machines which passed/failed the HAT, PreLAT and all other hardware-related tests

11.6.5.4. Record per machine on all movements from date of delivery, issues, receipts, HAT, PreLAT, pullout (if necessary), and the like.

11.6.6. Report export facility to PDF format;

11.6.7. Other such functionalities which are common of inventory systems, and which shall be subject to final approval by the COMELEC.

12. The COMELEC shall have control on all tests to be conducted.

13. The winning bidder shall provide for technical support and manpower complement in the conduct of HAT, PRELAT, Reverse Logistics (testers, logistics, packers, etc.)

14. The winning bidder shall deploy all EVMs, VVPATboxes, and other AES equipment and peripherals, including all other AES-related consumables, supplies and materials.
    14.1 Deployment shall be for field test, mock elections, and trainings (for field personnel, BEIs, BOCs).
    14.2 Contingency equipment, consumables, supplies and materials shall be included in the items for expected deployment to the designated sites.

15. After the receipt of the machines from the Deployment Service Provider, the winning bidder shall conduct post-election activities which include Inspection, Inventory and Testing, based on the timelines, under the supervision of the COMELEC. The winning bidder shall perform the following:

    15.1 Turn-over to COMELEC all storage devices and supplies and materials, retrieved during the conduct of reverse logistics;

    15.2 Provide the COMELEC with the system for backing-up, viewing and printing of all files stored in the removable devices for use in case of election protests, at no additional cost to COMELEC; and

    15.3 Provide technical support in this activity.

16. The winning bidder shall submit a post-election report to the COMELECon all activities undertaken pertaining to the project one month after e-Day.

17. The winning bidder shall submit a plan on the conduct of training, tests, setting-up, configuration, FTS and e-Day activities, back-up, closing and other related activities.

18. The winning bidder shall provide:

18.1 project management support to manage the submitted plan and be specifically responsible for the following, among other tasks:

18.1.1. overseeing and implementing the plan;

18.1.2. coordinating with the COMELEC on all related aspects of the Project;

18.1.3. monitoring the progress and status of the activities;

18.1.4. resolution of related problems;

18.2. The project management support of the winning bidder shall coordinate and report regularly with COMELEC

II. TRAINING - Training requirement shall include the following:

1. A COMELEC approved training program for executives;
2. An extensive training or transfer of technology. The training shall be in two (2) stages (1 – before the customization of systems, for testing and preparation of customization requirements and 2 – using the final customized system). The training shall address, but shall not be limited to, the following topics:

2.1. Installation and configuration of systems (EMS, EVM) from scratch;

2.2. Generation of election configuration for EVM and ballot faces;

2.3. Installation of election configuration in EVM ;

2.4. Operation and administration of all provided applications and third party systems;

2.5. Format or template of EVM file output input to CCS and central server and CCS output input to next level CCS and central server

2.6. Repair, troubleshooting, tuning up and maintenance of hardware and software;

2.7. Designing, printing and reformatting ballot faces and all election reports;

2.8. Safeguards to prevent and detect tampering or theft;

2.9. Critical system errors

2.10. Security and intrusion prevention and detection systems; and

2.11. Contingency plan.

3. A training for trainers and DOSTcertifiers, which shall include:

3.1. Setting up and testing the machines, and components thereof;

3.2. Proper operation and security of the machines from start to finish;

3.3. Troubleshooting methods to quickly identify and resolve problems.

4. Training programs for the BEIs and Random Manual Audit Team subject to COMELEC approval
5. Training for the Technical Support
6. Re-training of COMELEC trainers in case of substantial changes in the system;
7. Training materials should be submitted to and approved by COMELEC prior to printing; and
8. All training machines, consumables, manuals and training materials should be provided by the winning bidder;
9. The winning bidder shall provide for replacement or additional manuals when required by the COMELEC.

Risk Management and Contingency Planning

The winning bidder shall provide the following:

1. Risk management program that shall address security and other related risks (environmental, physical, political, people-related risks, etc.) that the project might encounter in the course of project implementation and more so anticipate the possible risks after the Project. Such program shall include trainings and workshops that shall incorporate skills enhancement modules for all personnel involved in the Project.

2. Back-up plan in case of systems failure in any of the Project components. For this purpose, a Contingency Plan Manual which shall cover all possible contingencies in all Project phases, (Technical, Operational, Training, Administrative and Support/Allied services aspects of the Project) shall be submitted to COMELEC. The said manual shall bring together all operational risks and problem areas, with their corresponding solutions, which shall be made into a repository of scenarios that shall apply, if necessary, to similar events in the conduct of future automated electoral exercises. It shall further include the corresponding risk controls and assessments, results from individual and collective feedbacks, key risk indicators, events such as losses and near-misses, current issues and remediation plans, among others.

    2.1. This shall also include issue and conflict resolution, in terms of providing alternative courses of action, in case of inevitable conflicts among the parties involved in the Project and the mitigation of risk in

case there are any.

2.2. The modules of the risk training and the Contingency Plan Manual shall be submitted to the COMELEC as indicated in the implementation calendar, for its evaluation, review and approval. In the evaluation and review of said documents, the Provider shall be required to provide a number of its personnel complement to the COMELEC to address all possible issues and concerns, determine the soundness and workability of the proposed contingency measures, and make sound proposals to change or improve said contingencies.

3. Risk monitoring tools (manual and automated) to track the identified and unidentified risks, including risk responses, responsibility assignment matrix (RACI).

Change Management

Bidders are required to submit its plan on the proposed change management services, with particular emphasis on the following areas:

1. Handling of change request or request of changes in the system after it has been accepted by COMELEC;

2. Transfer of Technology for the COMELEC executives, technical personnel, Board of Election Inspectors, Technical Support, Trainors, Machine Operators.

    2.1. This is Empowerment of the COMELEC personnel in terms of knowledge, attitudes and skills to eventually take over the functions and thereby enabling them to use the system in managing the electoral process more effectively;

3. Voter Education and Information

    3.1. The winning bidder shall provide adequate assistance and logistical support in the conduct of the information assistance and education campaign to be undertaken by the COMELEC. This assistance and support shall include, but shall not be limited to:

        3.1.1. Providing advice and recommendation to improve the information dissemination and education campaign of the COMELEC;

3.1.2. Providing reference materials;

3.1.3. Providing contact information and arranging consultations with other system users;

3.1.4. Providing resource speakers;

3.1.5. Providing technical assistance and consultancy in designing such information materials as may be, from time to time, required by the COMELEC in relation to the information and dissemination campaign of the COMELEC; and

3.1.6. Providing comprehensive public relations support for the project.

3.2. The winning bidder shall design, develop, and produce information materials for the following media:

3.2.1. Print – including but not limited to posters, fliers, streamers, pamphlets, and print advertisements; and

3.2.2. Broadcast – including but not limited to audio clips and video clips, in the best suitable formats appropriate for radio airing, and for uploading to the internet.

3.3. The winning bidder shall also be responsible for designing, developing, and producing the following;

3.3.1. A comprehensive manual on the use and operation of the system;

3.3.2. A comprehensive list of frequently asked questions, with suggested answers, on the use and operation of the system; and

3.3.3. Such other information materials as may, from time to time, be reasonably and seasonably required by the COMELEC.

3.4. The winning bidder shall provide an adequate number of demo units for road show to be taken from the contingency units.

3.5. The winning bidder shall co-develop and co-maintain, in close coordination with a COMELEC-designated webmaster, a voter education and information website for this project.

The proposal shall include the delivery of all requirements, including hardware, software, services, technical training, and communications link, which shall be formally turned over to the COMELEC upon the completion of the project.

Quality Control and Quality Assurance

The COMELEC shall conduct a project audit at periodic intervals of the progress of the winning bidder's schedule of work and deliverables to ensure that the Project delivers a range of Products, which may be goods and services, of an appropriate quality within time scales and budget.

1. For purposes of evaluation of the bids, the Bidders must describe their standards for audits including scope, required conduct, demands upon project personnel, demands upon the COMELEC personnel and outputs.

    1.1. If the winning bidder is found to have given erroneous or conflicting data or information in the course of the Project's implementation, inadvertently or otherwise, it shall bear the corresponding costs for the rectification/correction thereof, and the imposition of applicable penalties and its effect to the provisions of the Contract pertinent thereto, as the COMELEC may deem proper under the circumstances.

2. The winning bidder shall provide pertinent guidelines and procedures to aid the COMELEC in the crafting and development of Quality Assurance criteria for the evaluation of the various phases and/or activities of the Project.

3. The following tasks shall also be required:

    3.1. Develop and implement procedures for the measurement and monitoring of the SLAs for the other components of the Project;

    3.2. Assist in the regular monitoring of SLA compliance for all components;

    3.3. Assist in the conduct of a 3rd party Stress and Security Testing of all systems;

    3.4. Assist in the conduct of a 3rd party code review of the system;

    3.5. Assist in recommending acceptance and payment for the services or outputs, and/or the position of penalties where

applicable;

COMPONENT 3: VVPAT Boxes

The winning bidder shall comply with the following minimum requirements for ballot boxes, and all other related goods and services for the purpose.

1. The winning bidder shall provide to COMELEC, VVPAT boxes with the same number of units as with EVM.

4. The VVPAT boxes shall comply with the following minimum security requirements:

    4.1. The material of the VVPAT box shall be such that VVPATs that are being deposited therein shall be visible from the outside as falling into it.

    4.2. The material of the VVPAT box shall be of such quality that the names on the VVPAT shall not be seen from the outside.

    4.3. The VVPAT boxes shall have three (3) slots for the placement of one (1) security padlock each to be separately supplied by COMELEC.

    4.4. The design of the VVPAT box shall be such that there shall be no crack or split in the body and in the cover that may be used for getting access to the VVPATs inside it.

    4.5. The design of the closed VVPAT box shall protect its contents from water spill coming from rain.

5. The design of the VVPAT boxes shall be such that:

    5.1. It shall be separate from the EVM or can be attached to the EVM;

    5.2. Each has a detachable cover from the body;

    5.3. The cover shall have a locking mechanism to lock it to its body;

    5.4. In case the VVPAT box can be attached to the EVM

        5.4.1. There shall be a mechanism to seal the VVPAT entry point on the VVPAT box cover, when the EVM is not mounted on it;

        5.4.2. The EVM can be locked in place without slipping accidentally when placed on top of it;

    5.5. Each can hold up to 800 pieces of VVPAT;

5.6. Twelve (12) pieces can be stacked when empty and without cover;

5.7. Five (5) pieces can be stacked when with contents and with cover, with the padlocks placed;

5.8. The body shall bear the logo or name of the COMELEC and shall be readily visible from the outside;

5.9. Each can be reused for at least three (3) elections;

5.10. each shall survive a drop test from a height of 30.0 cm;

6. The VVPAT boxes shall be turned over at no additional cost to COMELEC after e-Day.

   6.1. The VVPAT boxes shall be considered COMELEC property.

7. The bidder shall provide for a prototype of the VVPAT box during the submission of bids.

   7.1. The bidder shallsubmit the design and specifications of the proposed VVPAT box, taking into consideration the existing guidelines on provision of physical security.

   7.2. The bidder shall submit the customizable features in the design of the VVPAT box.

   7.3. The final design of the VVPAT box for use on e-Day shall be subject to the approval of COMELEC.

8. The winning bidder shall provide the number of VVPAT boxes based on the allocation requirement of the COMELEC.

9. The winning bidder shall deliver the VVPAT boxes at the place to be designated by the COMELEC, based on timelines.

COMPONENT 4: Technical Support

Aside from the technical support requirements in all tests activities, reverse logistics, training and public demonstration, the winning bidder shall also provide the needed technical support for FTS and e-Day with the following requirements:

1. At least one (1) qualified technician for every 2 clustered precincts. However in polling centers with more than one (1) technician,a lead technician shall be designated among them to be the overall technical supervisor for the polling center.

   1.1 The technician shall have the following minimum qualifications:

      1.1.1 At least high school graduate;

      1.1.2 Not over 40 years old;

      1.1.3 With Information Technology Skills as certified by COMELEC;

      1.1.4 Physically fit and can work under pressure even on extended hours;

      1.1.5 Has no derogatory record in NBI;

      1.1.6 Able to speak, read and write English or the local dialect where they will be assigned;

      1.1.7 Not related within the fourth civil degree of consanguinity or affinity to any member of the BEI serving in the same Polling Center or to any national or local candidate to be voted for in the same city or to the latter's spouse; and

      1.1.8 Has no pending case against him filed in COMELEC/court for any election offense

   1.2 The winning bidder shall provide COMELEC the complete list of technician with their complete addresses and contact numbers not later than 60 days before elections after consultation with the COMELEC.

   1.3 During the bidding, the bidder shall submit a certification that the qualifications requirements for technician shall be provided by the winning bidder.

2. There shall be one (1) technical coordinator who shall supervise all the technicians in all polling centers.

3. The technician shall be responsible for the installation and pullout of the machines and peripherals, at the polling center and canvassing centers.

4. The bidder shall submit to COMELEC its recruitment and training plans for technicians for approval.

5. Replacement of technicians for whatever reasons shall be at the cost of the winning bidder and at no additional cost to the COMELEC.

6. The COMELEC has the right to reject and demand replacement of any approved hiree.

7. The recruitment and training of technicians shall be monitored by COMELEC.

8. The winning bidder shall maintain a pool of reserve trained technicians who can readily be hired and deployed to replace technicians who resign or fail to report for duty.

9. The winning bidder, within the same day from its knowledge through its field supervisors, report by fastest means to the Election Officer the resignation or failure to report for duty of support technicians within the latter's area of jurisdiction. The report shall be followed with a written report within twenty-four (24) hours from the initial notice.

10. No technicians shall be deployed for actual duty by the winning bidder unless he/she has undergone the required technical training and has been certified to be qualified to perform the required functions.

    10.1 The winning bidder shall furnish the Election Officer the complete names, addresses and contact numbers of replacement technicians hired in the latter's area of jurisdiction.

11. The COMELEC shall not be liable for the payment of technicians who resign or fail to report to duty.

    11.1 Neither shall it be obliged to pay any salary for the areas where no technicians were hired by the winning bidder.

12. The winning bidder shall provide the sufficient number of qualified technical support personnel to man the technical hotlines and to give solution/s to the reported problems at the NTSC. Aside from the requirement of Head technical support who shall supervise his team, the following are the requirements for all levels of technical support required for FTS and e-Day:

LEVELS OF TECHNICAL SUPPORT	QUALIFICATIONS	SCHEDULE (Aside from the other needs of the winning bidder for NTSC, the following schedules are required by COMELEC)
First-level technical hotline operators, who shall handle reports received through telephone call, text	• IT-capable; • At least college-level; • Proficient in Microsoft Office applications (Word and Excel); • Skill to accurately type a	<u>April 20, 2016 -May 2, 2016</u> • at least 5 operators • 8:00 am to 5pm • Monday to Saturday

message, email, or any other means of communication from the field technicians nationwide; (at least 10 per shift)	minimum of 25 wpm and keep • accurate records of information received via computer; • Good communication and listening skills; • Ability to speak clearly and concisely over the telephone; • Ability to interpret and give both verbal and written • instructions; • Must be detail-oriented; and • At least one (1) year working experience as call center agent.	<u>May 3 to 7, 2016</u> • At least 10 operators • 8:00 am to 7pm • Monday to Saturday <u>May 8 to 16, 2016</u> • At least 10 operators per shift • 24 hours (2-shifts) <u>May 17to 25, 2016</u> • at least 5 operators • 8:00 am to 5pm • Monday to Friday
Second-level technical staff, who shall consolidate all received reports and act on the reports that cannot be acted upon by the first-level hotline operators. (at least 2 per shift)	• IT-capable; • college-graduate; • Proficient in Microsoft Office applications (Word and Excel); • Skill to accurately type a minimum of 25 wpm and keep • accurate records of information received via computer; • Good communication and listening skills; • Ability to speak clearly and concisely over the telephone; • Ability to interpret and give both verbal and written • instructions; • Must be detail-oriented; and At least two (2) years working experience as call center agent.	<u>April 20, 2016 -May 2, 2016</u> at least 2 operators • 8:00 am to 5pm • Monday to Saturday <u>May 3 to 7, 2016</u> • At least 2 operators • 8:00 am to 7pm • Monday to Saturday <u>May 8 to 16, 2016</u> • At least 2 operators per shift • 24 hours (2-shifts) <u>May 17 to 25, 2016</u> • at least 2 operators • 8:00 am to 5pm • Monday to Friday
Third-level technical staff, who shall address all technical issues which cannot be solved by all levels of technical support.	• With at least five (5) years experience in using the proposed AES components or subsystems; • With extensive training on the proposed system;	<u>April 20, 2016 -May 2, 2016</u> • at least 2 technical support (TS) • 8:00 am to 5pm • Monday to Saturday <u>May 3 to 7, 2016</u>

(at least 2 per shift)	• Can communicate fluently in English; • Performs well under stress or pressure; • Medically certified to be physically fit;	• At least 2 TS • 8:00 am to 7pm • Monday to Saturday <u>May 8 to 16, 2016</u> • At least 2 TS per shift • 24 hours (2-shifts) <u>May 17 to 25, 2016</u> • at least 2 TS • 8:00 am to 5pm • Monday to Friday

13.1. Two (2) months before e-Day, the winning bidder shall provide for a procedures or set of rules to be followed at the NTSC by the technical support, including documentation on the possible systems problems that may encounter and the possible solutions to the problems

13.2. The winning bidder shall submit resume of all levels of technical support which shall be approved by COMELEC two (2) months before its operation.

13.3. All technical support and personnel at the NTSC shall sign a Non-Disclosure Agreement (NDA) before the start of NTSC operation

13.4. Verified reports of incorrect handling or answering of queries shall be charged as penalties to the winning bidder.

13.5. During FTS and e-Day, the manner and frequency of reporting of the technicians to the first-level hotline operators shall be as follows:

13.5.1. Attendance of technical support in the field;

13.5.2. Successful installation of machines;

13.5.3. Start of voting in specific precincts;

13.5.4. Any irregular condition of the machine before, during and after voting;

13.5.5. Loss of equipment, parts of equipment, or peripherals;

13.5.6. Closing of voting;

13.5.7. Transmission;

13.5.8. Packing-up; and

13.5.9. Pull-out.

13.6. The NTSC shall be activated twenty (20) days before e-Day until fifteen (15) days thereafter, particularly for the following activities based on the timelines:

13.6.1. Delivery of machines and electronic transmission to the polling centers and canvassing centers;

13.6.2. Delivery of election supplies and paraphernalia, ballots and ballot boxes to the Office of the Treasurer;

13.6.3. Final Testing and Sealing;

13.6.4. Voting, counting and canvassing; and

13.6.5. Pull-out of machines.

13.7. NTSC operations and systems security shall be controlled by the COMELEC.

13.7.1. All passwords or security controls of the system shall be provided and handled by COMELEC.

14. The bidder shall submit the number of technical support personnel to be hired, and the plan for hiring, training, documentation and operational procedures;

15. All activities to be undertaken by the winning bidder at the NTSC, such as planning, preparation, training, setting-up, execution, back-up, closing and other related activities shall be coordinated and approved by COMELEC.

16. The winning bidder, through COMELEC, shall coordinate with the NTSC provider on the requirements for space, system, data, reporting, coordination and other related requirements.

17. The winning bidder shall provide coordinators with field of specialization on all items above and shall submit proof of specialization such as resume, certification of expertise, certification of number of years of experience and the like and shall perform the following:

17.1. Provide support and logistics to each team of the COMELEC PMO; and

17.2. Submit report as required by COMELEC PMO timelines.

18. Aside from the technical skills qualifications, the technical support shall have the following qualifications:

18.1. Is of good moral character

18.2. Has never been convicted of any election offense or any other crime punishable by more than six (6) months of imprisonment;

18.3. Has no pending case against him filed in COMELEC/court for any election offense;

18.4. Not related within the fourth civil degree of consanguinity or affinity to any member of the BEI serving in the same Polling Center or to any national or local candidate to be voted for in the same city or to the latter's spouse

IMPLEMENTATION CALENDAR

Task Name	Start	Finish
A. Automation Project - May 9, 2016 Elections	**Tue 12/3/13**	**Mon 10/31/16**
1. Convening of COMELEC Steering Committee	**Tue 12/3/13**	**Mon 5/9/16**
2. Determination of AES Technology to use	**Thu 3/27/14**	**Tue 8/26/14**
Convening of COMELEC Advisory Council	Thu 3/27/14	Thu 3/27/14
DBM Approval of Budget	Thu 6/26/14	Thu 6/26/14
CAC Technology Fair	Sun 7/27/14	Sun 7/27/14
Submission of CAC Recommendation of Technology to use	Fri 8/15/14	Fri 8/15/14
COMELEC EnBanc Resolution on Technology to Use	Fri 8/29/14	Fri 8/29/14
3. Terms of Reference (TOR)	**Mon 6/30/14**	**Tue 10/14/14**
Drafting of TOR	Mon 6/30/14	Tue 9/30/14
Submission of 1st Draft	Wed 09/24/14	Wed 10/01/14
COMELEC Technical Committee Review of TOR	Mon 10/03/14	Fri 10/10/14
Workshop to Finalize TOR with CAC	Sat 10/11/14	Sun 10/12/14
Submission of Final TOR to EnBanc	Mon 10/13/14	Mon 10/13/14
Approval by the Enbanc	Tue 10/14/14	Tue 10/14/14
4. Project Management Team Formation and Operation	**Wed 10/15/14**	**Thu 11/10/16**
5. Bidding process (invitation to bid to issuance of notice to proceed	**Wed 10/15/14**	**Wed 3/18/15**
6. Systems Customization/Development	**Thu 3/19/15**	**Tue 9/22/15**
Delivery of equipment for testing (at least 20 units), machines, peripherals, supplies, materials, ballots and base systems for EMS, VCM and CCS	Thu 3/19/15	Fri 3/27/15
Train COMELEC technical personnel on the operation of base systems (for customization requirements preparation)	Fri 3/27/15	Fri 4/10/15
Preparation of customization requirements(COMELEC)	Fri 3/27/15	Sat 4/25/15

Actual customization of systems/ systems development(Provider)	Wed 4/08/15	Tue 9/22/15
7. Delivery of systems/customized application software	**Wed 7/15/15**	**Wed 9/23/15**
8. Testing of systems/application software (Lab Test)	**Thu 7/16/15**	**Wed 9/30/15**
Delivery of equipment, machines, peripherals, supplies, materials, ballots and customized systems for EMS, VCM and CCS (for lab test)	Wed 7/15/15	Wed 7/15/15
9. Machines Build-Up(manufacturing of machines)	**Wed 3/25/15**	**Tue 8/25/15**
10. Refurbishment of Existing Machines	**Mon 01/05/15**	**Mon 07/06/15**
11. Delivery of machines (VCM, CCS, EMS servers, printers, CS, TS, BS, Website, workstations, network devices, UPS, batteries, etc.)	**Tue 6/02/15**	**Wed 09/02/15**
12. Testing and acceptance of machines	**Mon 6/15/15**	**Tue 09/15/15**
13. Field Test Activities	**Sat 10/10/15**	**Thu 10/22/15**
Delivery of equipment, machines, peripherals, supplies, materials, ballots and base systems for EMS, VCM and CCS including transmission media and service	Sat 10/10/15	Sat 10/10/15
Field test 1	Thu 10/15/15	Thu 10/15/15
Field Test 2 (if applicable)	Thu 10/22/15	Thu 10/22/15
14. COMELEC Systems Acceptance	**Mon 10/30/15**	**Mon 10/30/15**
15. TEC Systems Certification	**Mon 6/1/15**	**Tue 12/15/15**
16. Local Source Code Review (Base Code)	**Wed 7/15/15**	**Sat 8/15/15**
Local Source Code Review (after TEC Certification)	Tue 1/5/16	Mon 1/25/16
17. Release of General Instructions	**Mon 10/26/15**	**Mon 10/26/15**
18. Mock Election	**Sun 11/08/15**	**Sun 11/08/15**
19. Release of Contingency Plan	**Mon 11/23/15**	**Mon 11/23/15**
20. Final Project of Precincts (POP), List of Voters and List of Candidates	**Tue 12/15/15**	**Tue 12/15/15**

Last day of Registration	Sat 10/31/15	Sat 10/31/15
PCVL Supplies and Consummables Readiness	Sat 10/31/15	Sat 10/31/15
Filing of Certificate of Candidacy	Sun 10/11/15	Thu 10/15/15
Submission of Certificate of Candidacy to Law Department	Mon 10/19/15	Mon 10/19/15
21. Random Manual Audit (RMA)	**Thu 10/15/15**	**Tue 1/5/16**
Constitution of RMA Committee to draft the Rules	Thu 10/15/15	Thu 10/15/15
Formulation of Rules and Guidelines	Fri 10/16/15	Thu 12/3/15
Constitution of RMA Teams	Tue 1/5/16	Tue 1/5/16
22. Hiring of Technical Support	**Tue 12/1/15**	**Mon 2/1/16**
23. Constitution of BOCs/BEIs	**Tue 1/5/16**	**Mon 1/18/16**
24. Training	**Tue 6/30/15**	**Fri 4/8/16**
Delivery of machines, peripherals, sample Ballots and other supplies and materials for different levels of training	Sat 8/01/15	Sat 8/01/15
Transfer of Technology of COMELEC technical personnel including Quality Assurance and Data Center Administrators/Operators	Tue 9/01/15	Thu10/01/15
Train COMELEC Executives	Tue 11/3/15	Thu 11/5/15
Train trainors	Thu 11/26/15	Wed 11/28/15
Train COMELEC field personnel on operation of VCM and CCS (with information technology-capable person on canvassing site) including use of transmission media	Tue 12/15/15	Sat 1/16/16
Train BOCs/BEIs (including IT-capable person)	Mon 2/01/16	Fri 4/01/16
Train OAV DFA Personnel	Mon 3/20/16	Fri 4/01/16
Train National Support Agents	Mon 4/04/16	Fri 4/08/16
25. Conduct Public demonstration using machines	**Tue 12/01/15**	**Fri 4/08/16**
26. Ballots and Machines configuration and testing	**Tue 12/15/15**	**Sat 4/30/16**
Setting up of Printer(including testing)	Tue 12/1/15	Tue 12/22/15
Setting up of machines for creation of configuration, ballot face, etc.	Tue 12/01/15	Tue 12/15/15
Preparation of data for configuration	Wed 12/16/15	Wed 12/30/15

Creation of configuration, ballot face, etc	Mon 1/5/16	Wed 4/20/16
Ballot Printing for PreLAT, FTS and Election	Mon 1/10/16	Mon 4/25/16
Setting of Configuration of machines	Mon 2/15/16	Sat 4/30/16
PRE-LAT (end to end testing of VCM, CCS, AES servers in their actual configuration, with the ballots)	Mon 2/15/16	Sat 4/30/16
27. Transmission Preparation	**Thu 4/02/15**	**Fri 4/15/16**
Testing of transmission media	Thu 4/02/15	Fri 10/30/15
Delivery of transmission media for VCM, CCS and AES servers	Thu 4/02/15	Thu 10/01/15
Acceptance test for transmission media	Wed 4/15/15	Fri 10/30/15
Transmission Site Survey to Selected Areas	Mon 10/19/15	Mon 11/16/15
Testing of transmission service (Transmission readiness test, failover test, HA test, connectivity test, Stress test)	Mon 12/01/15	Fri 4/15/16
Transmission test	Tue 3/15/16	Fri 4/15/16
28. Servers for CS, WS, TS, BS setup (to be installed in WH)	**Mon 11/2/15**	**Mon 11/2/15**
29. EDCVL Printing and Shipment	**Mon 1/4/16**	**Thu 3/24/16**
30. Site Preparation	**Fri 2/20/15**	**Mon 4/25/16**
Warehouse Set-up	Mon 6/01/15	Mon 6/01/15
Data Centers Set-up(CS, WS, TS, BS)	Mon 11/30/15	Mon 11/30/15
National Support Center Set-Up	Fri 4/15/16	Fri 4/15/16
Voting/ counting/ canvassing sites	Wed 3/2/16	Mon 4/25/16
Transmission sites	Wed 3/2/16	Mon 4/25/16
COMELEC and TEC Acceptance of Transmission Systems	Wed 4/20/16	Wed 4/20/16
31. Deployment	**Wed 3/2/16**	**Mon 5/2/16**
Deployment of machines/transmission equipment to Regional Hubs	Wed 3/2/16	Mon 4/25/16
Ship ballots (including for OAV)	Mon 3/21/16	Mon 5/2/16
Deployment of machines/transmission equipment to Polling Centers/ Canvassing Centers	Mon 4/25/16	Mon 5/02/16
32. Final Testing and Sealing (FTS)	**Mon 5/2/16**	**Fri 5/6/16**
33. Election Day	**Mon 5/9/16**	**Mon 5/9/16**

34. Count precinct and proclaim City/ Municipality winners	**Mon 5/9/16**	**Thu 5/12/16**
35. Canvass results and proclaim winners	**Fri 5/13/16**	**Sun 5/15/16**
36. Post Election Activities	**Tue 5/13/16**	**Mon 10/31/16**
Back-up	Tue 5/10/16	Fri 6/24/16
Reverse Logistics	Tue 5/10/16	Mon 10/31/16
Submission of all back-up files (configuration and election results)	Tue 5/10/16	Fri 6/10/16
Turn-over of all storage devices, all consumables used	Tue 5/10/16	Mon 10/31/16
Submission of Post Election Reports	Mon 10/31/16	Mon 10/31/16

ESTIMATED PROJECT STATISTICS

ITEM	FIGURE
Number of regions	17
Number of provinces	81
Number of legislative districts	234
Number of cities	144
Number of municipalities	1,490
Number of barangays	42,029
Number of polling/voting centers	36,772
Number of established precincts	344,529
Number of clustered precincts	77,829
Number of established precincts in cluster	7 max
Number of registered voters	
Per precinct	200 max
Per clustered precinct	800 max
Number of positions to be voted for	
President	1
Vice-President	1
Senator	12
Party-List Group	1
Member, House of Representatives	1
Provincial Governor	1
Provincial Vice-Governor	1
Provincial Board Members (number varies depending on the size of provincial district)	1-14
City/Municipal Mayor	1
City/Municipal Vice-Mayor	1
City/Municipal/District Councilor (number varies depending on the size of city/municipality/councilor district)	4-12
Additional positions for ARMM	
Regional Governor	1
Regional Vice Governor	1
Regional Assemblymen (per district)	3

Average number of candidates	
National positions	200
Local positions	350